

# GOOGLE MOTION CHARTS WITH R

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# Disclaimer

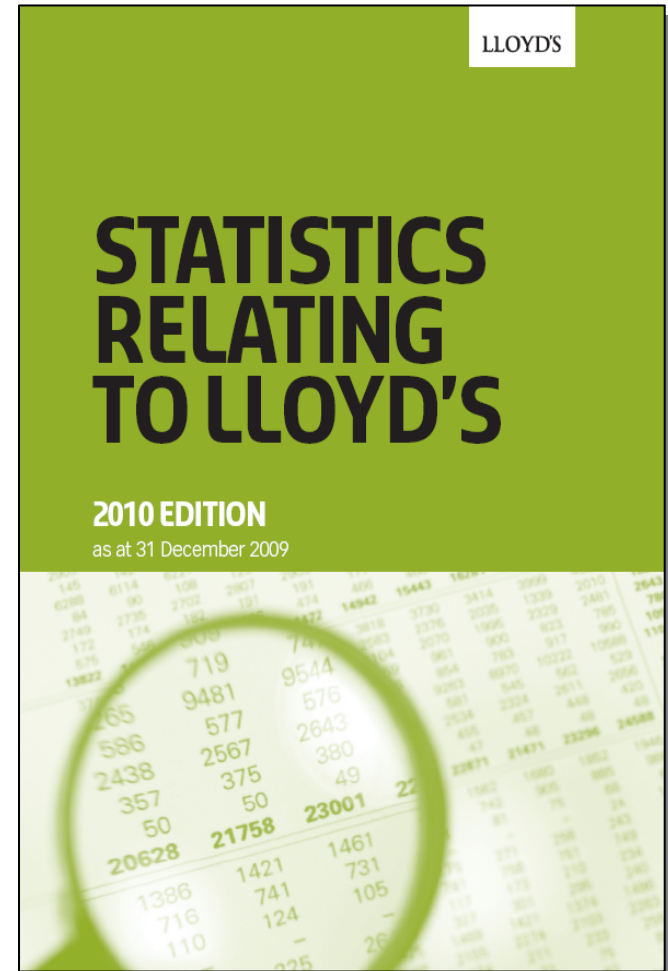
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# Agenda

- Motivation
- Google Motion Charts
- Google Motion Chart R package
  - `googleVis`
- Case study

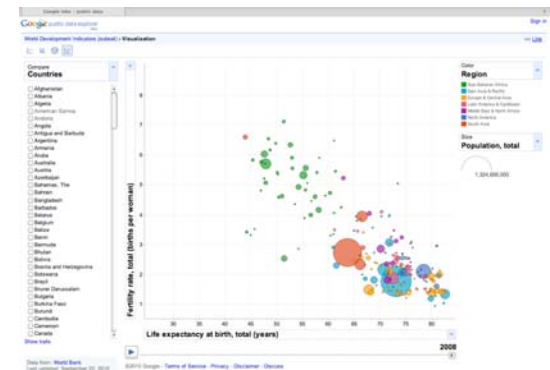
# Motivation

- Lloyd's started to published the 'Statistics relating to Lloyd's' in 2010
  - Summary of market statistics
  - P&L and balance sheet information by syndicate
  - Underlying data available
  - Online: [www.lloyds.com/stats](http://www.lloyds.com/stats)
- **How can we bring the data to life?**

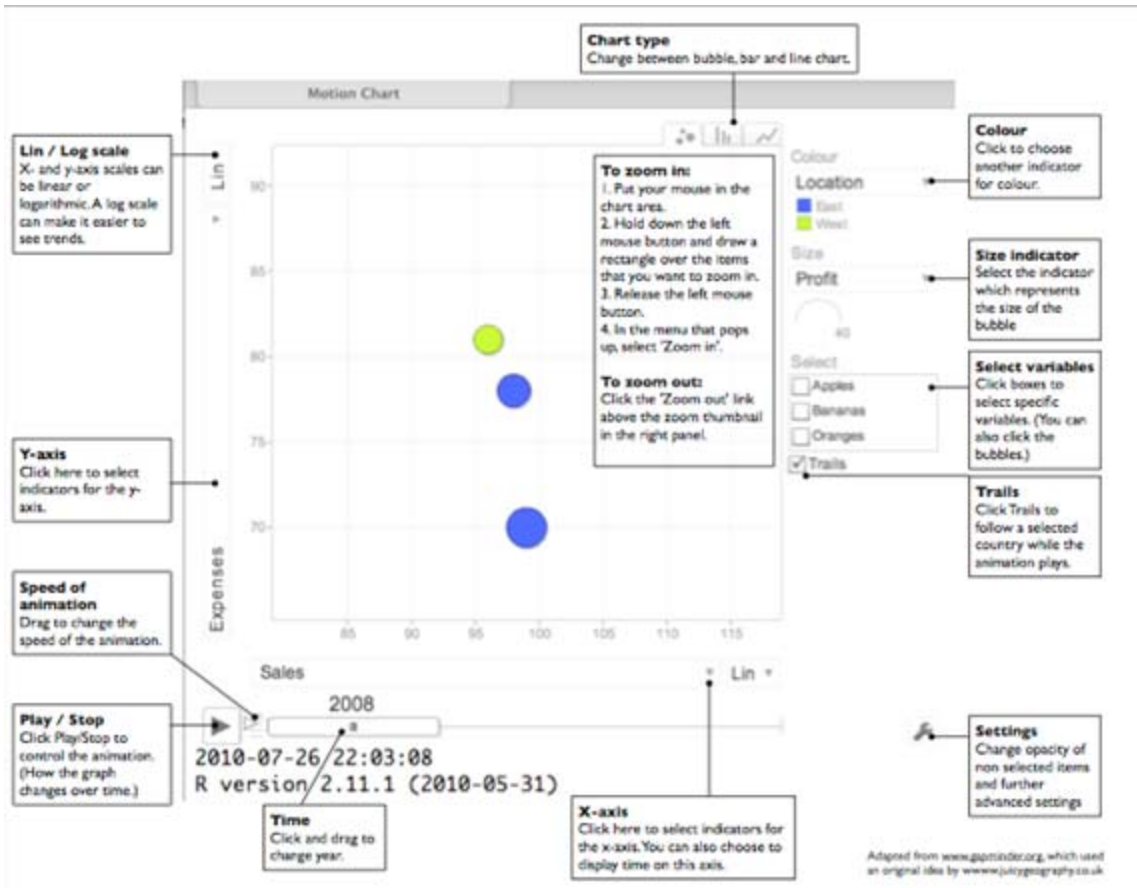


# Motion charts

- Popularized by Hans Rosling (Gapminder)
  - TED talk: [Hans Rosling shows the best stats you've ever seen](#)
  - [Google Open Data Explorer](#)
    - Access to public data
- Talk on Motion Charts by Sebastián Pérez Saaibi at Remetrics 2010 and BaselR July 2010
  - [Visualization of multivariate data over time](#)



# Google Motion Chart GUI

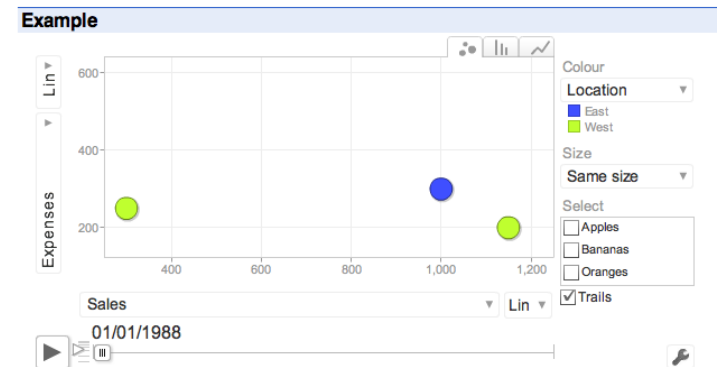


- A dynamic chart to explore several indicators over time.
- The chart is rendered within the browser using Flash.

# Google Motion Chart Api - Example

```
<html>
<head>
  <script type="text/javascript" src="http://www.google.com/jsapi"></script>
  <script type="text/javascript">
    google.load('visualization', '1', {'packages':['motionchart']});
    google.setOnLoadCallback(drawChart);
    function drawChart() {
      var data = new google.visualization.DataTable();
      data.addColumn('string', 'Fruit');
      data.addColumn('date', 'Date');
      data.addColumn('number', 'Sales');
      data.addColumn('number', 'Expenses');
      data.addColumn('string', 'Location');
      data.addRows([
        ['Apples',new Date (1988,0,1),1000,300,'East'],
        ['Oranges',new Date (1988,0,1),1150,200,'West'],
        ['Bananas',new Date (1988,0,1),300,250,'West'],
        ['Apples',new Date (1989,6,1),1200,400,'East'],
        ['Oranges',new Date (1989,6,1),750,150,'West'],
        ['Bananas',new Date (1989,6,1),788,617,'West']
      ]);
      var chart = new
google.visualization.MotionChart(document.getElementById('chart_div'));
      chart.draw(data, {width: 600, height:300});
    }
  </script>
</head>

<body>
  <div id="chart_div" style="width: 600px; height: 300px;"></div>
</body>
</html>
```



Source: <http://code.google.com/apis/visualization/documentation/gallery/motionchart.html>





# Google Motion Chart R package

- Idea: Create wrapper functions which take a `data.frame` and produce html output following the Motion Chart API
- Display html output via web server
  - Use `R.rsp` package by Henrik Bengtsson
    - R Server Pages and Light-weight HTTP daemon (server).

# Current functions

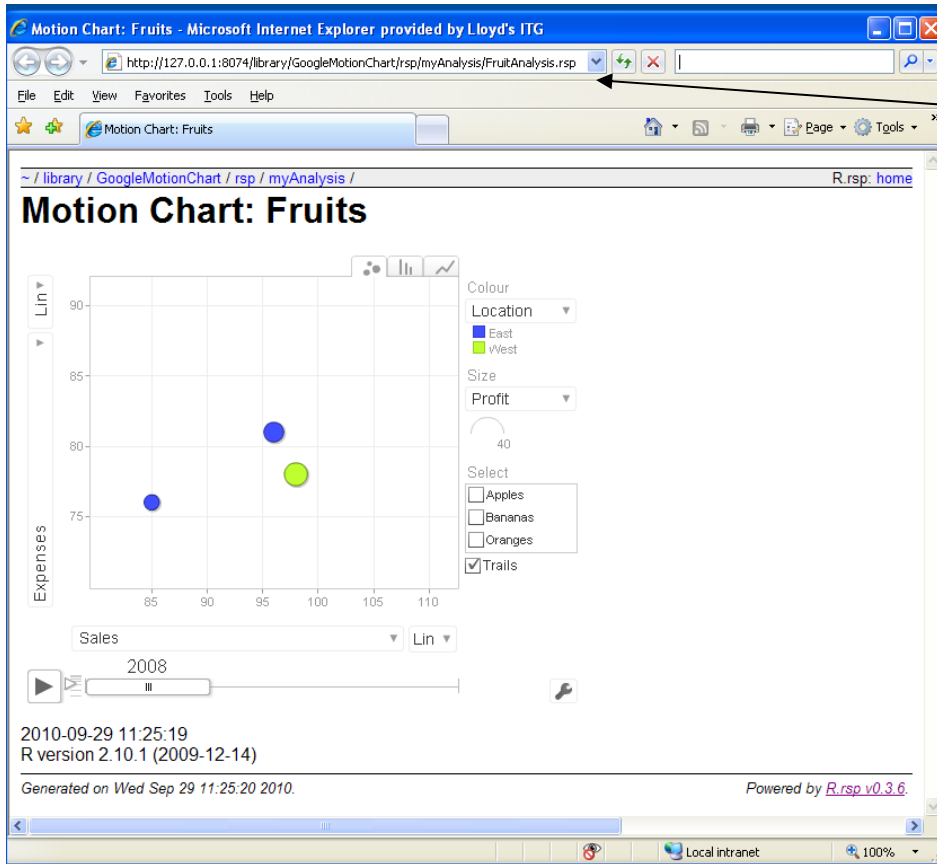
- Current package version 0.1.2 provides two functions
- **MotionChart**
  - Produces core html output
- **MotionChartPage**
  - Produces complete html page
- Input data requires data frame with an 'idvar' and 'timevar'
- Combination of 'idvar' and 'timevar' gives a unique row

# Example data set

> Fruits

|   | Fruit   | Year | Location | Sales | Expenses | Profit | Date       |
|---|---------|------|----------|-------|----------|--------|------------|
| 1 | Apples  | 2008 | West     | 98    | 78       | 20     | 2008-12-31 |
| 2 | Apples  | 2009 | West     | 111   | 79       | 32     | 2009-12-31 |
| 3 | Apples  | 2010 | West     | 89    | 76       | 13     | 2010-12-31 |
| 4 | Oranges | 2008 | East     | 96    | 81       | 15     | 2008-12-31 |
| 5 | Bananas | 2008 | East     | 85    | 76       | 9      | 2008-12-31 |
| 6 | Oranges | 2009 | East     | 93    | 80       | 13     | 2009-12-31 |
| 7 | Bananas | 2009 | East     | 94    | 78       | 16     | 2009-12-31 |
| 8 | Oranges | 2010 | East     | 98    | 91       | 7      | 2010-12-31 |
| 9 | Bananas | 2010 | East     | 81    | 71       | 10     | 2010-12-31 |

# Motion Chart Example



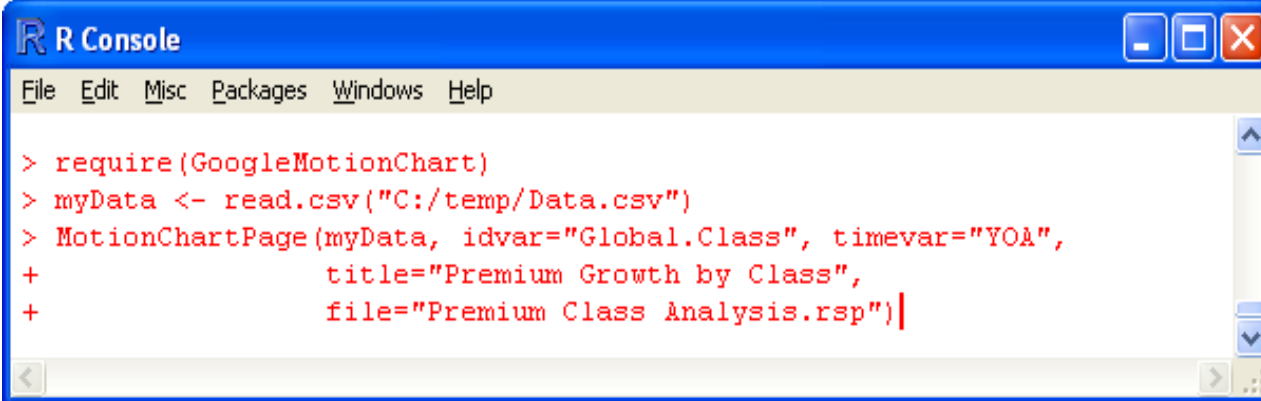
```
library(GoogleMotionChart)  
MotionChartPage(Fruits, idvar="Fruit", timevar="Year", file="FruitAnalysis.rsp")
```

# Next steps

- Develop package further. New name: **googleVis**
  - With a more generic framework
    - `gvisMotionChart`, `print.gvis`, `plot.givs`
  - Use of RJSONIO by Duncan Temple Lang from Omegahat
- Include further visualization APIs, such as
  - Table: `gvisTable`
  - Geo Map: `gvisGeoMap`
  - Tree Map: `gvisTreeMap`
- Publish on CRAN

# Case Studies

- Typical Application of Motion Charts in Business Environment:
  - Large Amounts of Data can be analysed visually
  - Various Measures can be compared simultaneously
  - Historic Development is visible
  - Outliers and exceptional performers can be identified easily
- Typical Code Snippet to create charts:

A screenshot of an R Console window. The title bar reads "R Console" and includes standard window controls (minimize, maximize, close). The menu bar contains "File", "Edit", "Misc", "Packages", "Windows", and "Help". The console area displays the following R code in red text:

```
> require(GoogleMotionChart)
> myData <- read.csv("C:/temp/Data.csv")
> MotionChartPage(myData, idvar="Global.Class", timevar="YOA",
+                 title="Premium Growth by Class",
+                 file="Premium Class Analysis.rsp")
```

# Case Study – Capacity by Class

LLOYD'S

THE WORLD'S LEADING INSURANCE MARKET

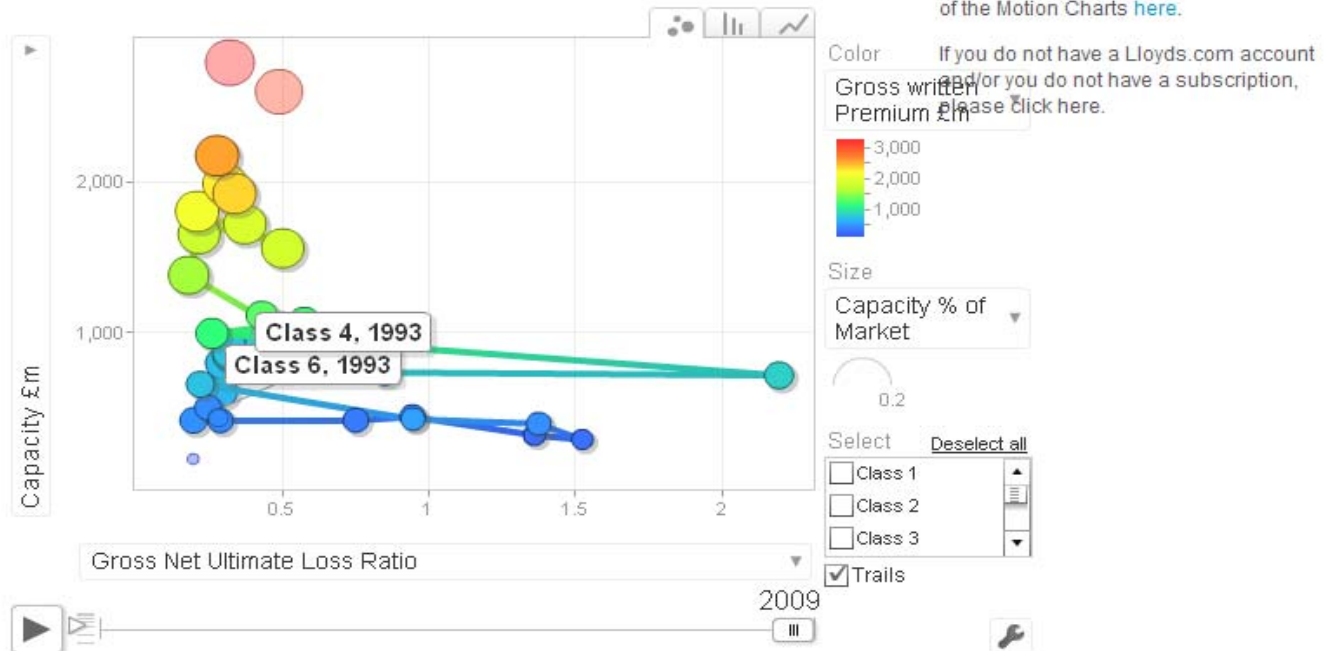
[LLOYD'S](#)
[THE MARKET](#)
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## CAPACITY SPLIT BY CLASS OF BUSINESS

The Motion chart below shows the overall market Capacity by year of account for Lloyd's high level classes of Business from 1993-2009 weighted as a percentage of the overall capacity in the market.

### WANT TO ACCESS THE FULL VERSION?

If you have a Lloyds.com account and a valid subscription to Statistics Relating to Lloyd's, you can view the full versions of the Motion Charts [here](#).

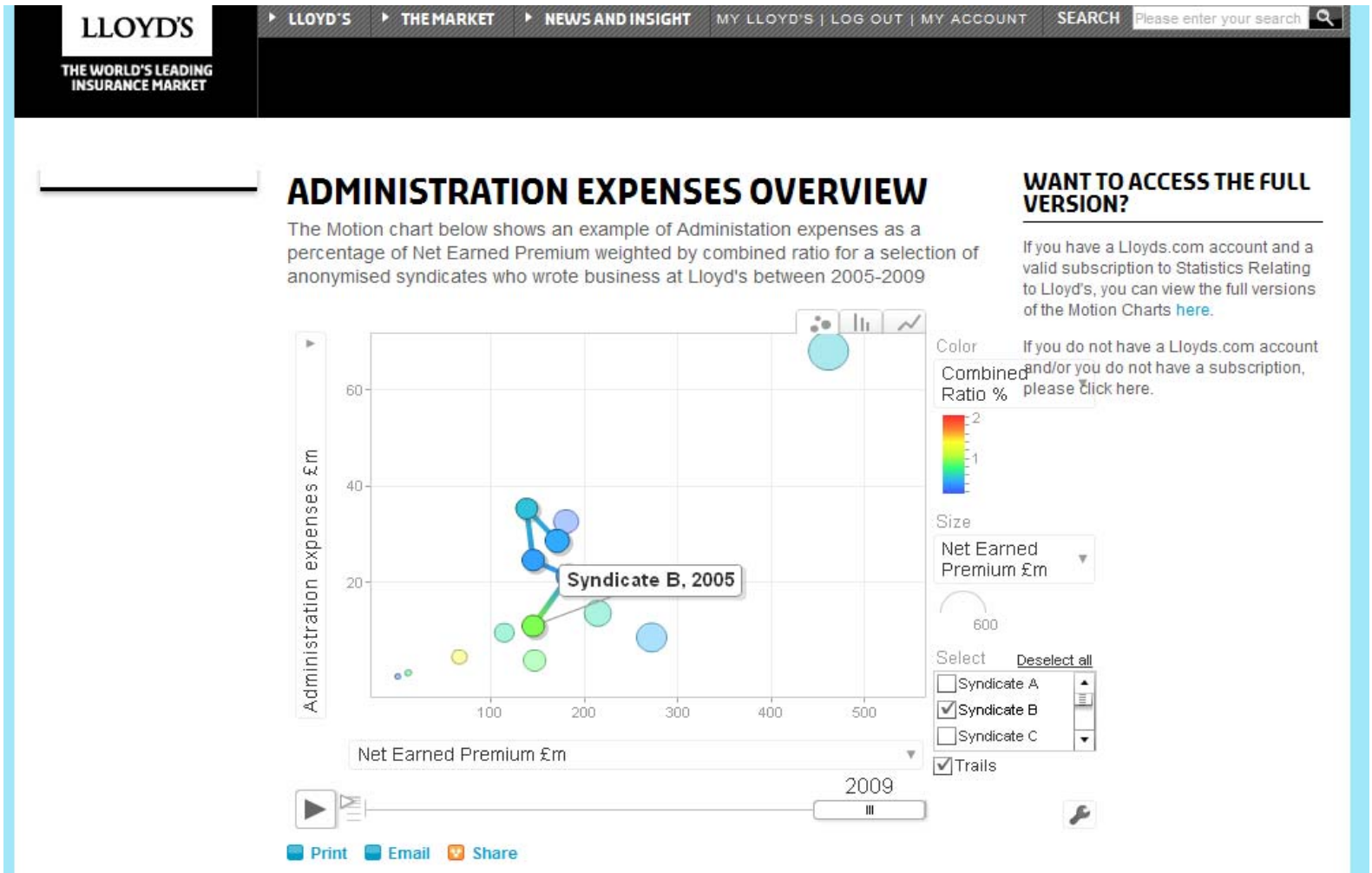


All figures are quoted in £GBP as at the relevant year end. No adjustment has been made for indexation.

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Dummy data for illustration purpose only.

# Case Study – Expense Overview



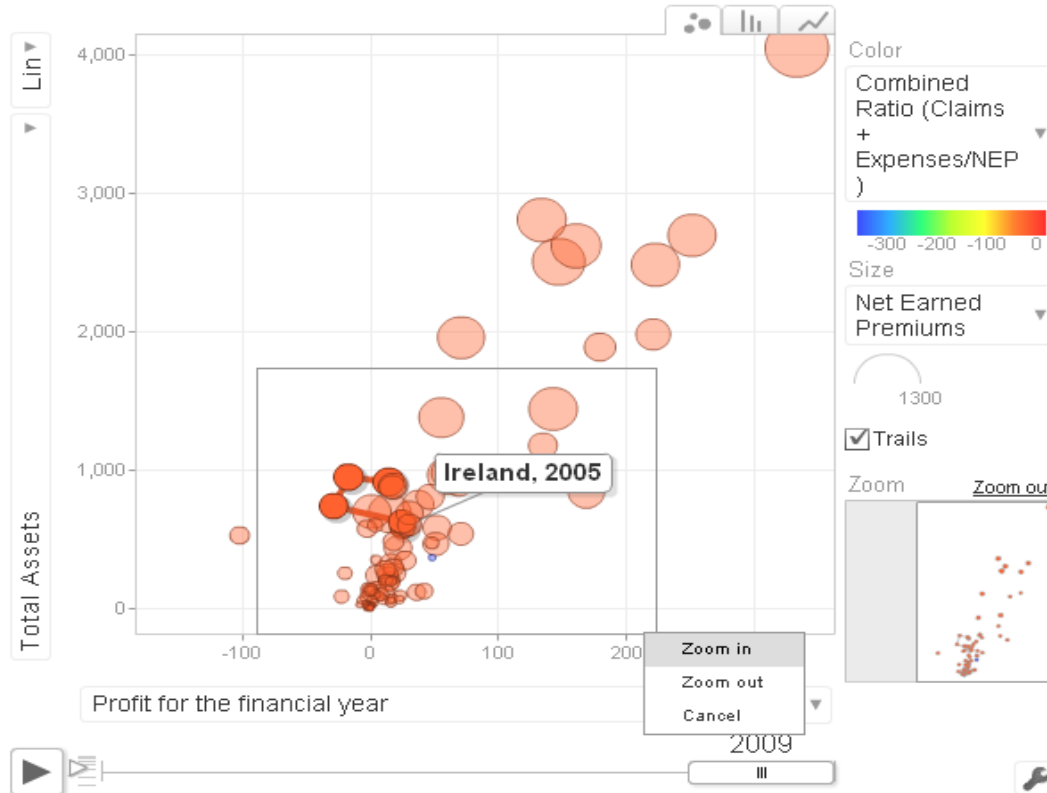
Dummy data for illustration purpose only.



# Case Study – Annual Account Analysis

~/ library / GoogleMotionChart / rsp / myAnalysis /

## Annual Accounts

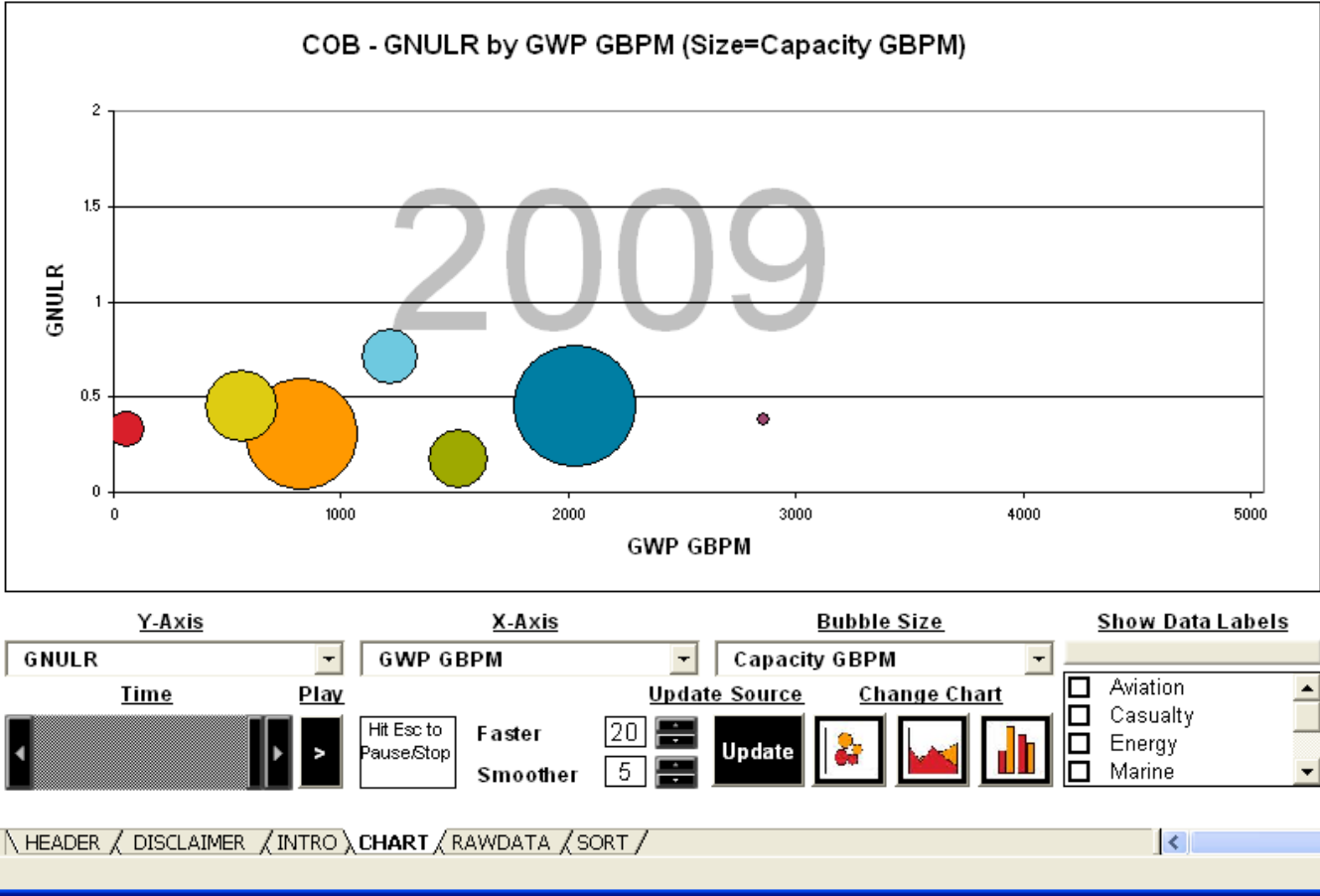


2010-09-30 14:03:17  
R version 2.10.1 (2009-12-14)

Generated on Thu Sep 30 14:03:22 2010.

Dummy data for illustration purpose only.

# Other Motion Chart Interfaces:



Will be available from [www.lloyds.com/stats](http://www.lloyds.com/stats) soon.

# Thanks.

- Any questions?